WINSTON & STRAWN LLP

North America Europe Asia

200 Park Avenue
New York, New York 10166-4193
T: +1 (212) 294-6700
F: +1 (212) 294-4700
www.winston.com

Facsimile

FROM: Davies, Mary Jo

DATE: 08/09/2011 10:59 AM

REFERENCE:
U.S. Application No. 10/574,120
Total pages Including Cover Sheet: 12

Please Deliver as Soon as Possible To:

RECIPIENT:	COMPANY:	FAX NO.:
Examiner A.P. Khare	US PTO	15712708608

IF YOU DO NOT RECEIVE ALL THE PAGES, PLEASE CONTACT THE SENDER OF THE FAX AS SOON AS POSSIBLE. THANK YOU.

COMMENTS:

Doc Code: M865 or FAI.REQ.INTV

PTOL-413A (08-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Applicant Initiated Interview Request Form

Application No.: 10/574120 First Named Applicant: Bruel
Examiner: Atul P. Khare Art Unit: 1742 Status of Application: pending

Tentative Participants:
(1) Allan Fanucci (2) Dwight Renfrew
(3) _____ (4) _____

Proposed Date of Interview: 08/11/2011 **Proposed Time:** 11 AM (AM/PM)

Type of Interview Requested:
(1) [✓] Telephonic (2) [ ] Personal (3) [ ] Video Conference

Exhibit To Be Shown or Demonstrated: [ ] YES [✓] NO
If yes, provide brief description: _____

Issues To Be Discussed

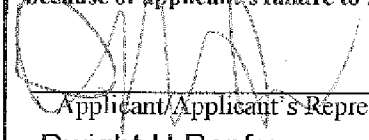
Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) Rej 102	34-36,41,46,50,53	Moriceau	[ ]	[ ]	[ ]
(2) Rej. 103	47, 48, 54	Moriceau	[ ]	[ ]	[ ]
(3)			[ ]	[ ]	[ ]
(4)			[ ]	[ ]	[ ]

[ ] Continuation Sheet Attached [ ] Proposed Amendment or Arguments Attached

Brief Description of Arguments to be Presented: Moriceau does not disclose the claimed intermediate layer that, in its as-deposited form and without post-depositional processing, can form microbubbles and micro cavities. Proposed claims will follow shortly.

An interview was conducted on the above-identified application on _____

NOTE: This form should be completed and filed by applicant in advance of the interview (see MPEP § 713.01). If this form is signed by a registered practitioner not of record, the Office will accept this as an indication that he or she is authorized to conduct an interview on behalf of the principal (37 CFR 1.32(a)(3)) pursuant to 37 CFR 1.34. This is not a power of attorney to any above named practitioner. See the Instruction Sheet for this form, which is incorporated by reference. By signing this form, applicant or practitioner is certifying that he or she has read the Instruction Sheet. After the interview is conducted, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible. This application will not be delayed from issue because of applicant's failure to submit a written record of this interview.



Applicant/Applicant's Representative Signature

Dwight H Renfrew
Typed/Printed Name of Applicant or Representative

38594
Registration Number, if applicable

Examiner/SPE Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Bruel	Confirmation No.: 7416
Application No.: 10/574,120	Group Art Unit: 1742
Filing Date: May 31, 2007	Examiner: A. P. Khare
For: METHOD OF PRODUCING A PLATE-SHAPED STRUCTURE, IN PARTICULAR, FROM SILICON, USE OF SAID METHOD AND PLATE-SHAPED STRUCTURE THUS PRODUCED, IN PARTICULAR FROM SILICON	Attorney Docket No.: 4717-36800

PROPOSED CLAIMS FOR DISCUSSION WITH THE EXAMINER

Mail Stop After Final
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This paper presents proposed claims that the Applicant would like to discuss with the Examiner at the interview now scheduled for August 11, 2011 at 11 AM. These claims are for discussion only and are not to be entered in this application.

Proposed amendments to the claims begin on page 2 of this paper.

Brief remarks begin on page 5 of this paper.

No fee is believed due with the paper; please charge any fee deficiencies to Winston & Strawn LLP Deposit Account No. 50-1814.

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions and listings of claims in this application.

Claims 1. to 33. (Canceled)

34. (currently amended) A method for fabricating a structure in the form of a plate which method comprises:

~~providing~~ depositing at least one intermediate layer on either of a substrate and/or a superstrate wherein the intermediate layer comprises at least one base material having distributed therein extrinsic atoms or molecules which differ from those of the base material;

assembling the substrate and the superstrate so that the intermediate layer is interposed between [[a]] the substrate and [[a]] the superstrate to form a structure, ~~with the intermediate layer comprising at least one base material having distributed therein extrinsic atoms or molecules which differ from those of the base material~~; and

applying a heat treatment to the structure in a temperature range that causes the intermediate layer to become plastically deformable with the as-deposited extrinsic atoms or molecules in the base material causing an irreversible formation of microbubbles or microcavities in the intermediate layer in a configuration and amount sufficient to weaken the intermediate layer.

35. (previously presented) The method as claimed in claim 34, which further comprises continuing the heat treatment until it produces a rupture of the intermediate layer and, as a result, separation of the substrate and the superstrate.

36. (previously presented) The method as claimed in claim 34, which further comprises applying forces between the substrate and the superstrate to bring about the rupture of the intermediate layer between the substrate and the superstrate due to the presence of the micro-bubbles or micro-cavities.

37. (canceled)

38. (currently amended) The method as claimed in claim 34, which further comprises chemically attacking the intermediate layer of the structure to ~~at least partially~~ remove the intermediate layer between the substrate and the superstrate.

39. (previously presented) The method as claimed in claim 34, wherein the extrinsic atoms or molecules cause the intermediate layer to be formed as a glass.

40. (currently amended) The method as claimed in claim 34, wherein ~~the extrinsic atoms or molecules cause an increase in thickness of~~ the intermediate layer increases in its thickness subsequent to the heat treatment as compared to its thickness prior to the heat treatment by as much as a factor of 3 [[or]] .

41. (currently amended) The method as claimed in claim 34, wherein, after the heat treatment, at least some the microbubbles or microcavities have a volume such that they are open both on the substrate [[or]] and on superstrate side [[and]] or furthermore ~~that they~~ are mutually open to constitute channels which are open [[to]] between the side ends of the intermediate layer.

42. (previously presented) The method as claimed in claim 41, which further comprises providing projecting portions in the substrate or superstrate which constitute notches that facilitate the formation of the channels.

43. (currently amended) The method as claimed in claim [[40]] 41, which further comprises cooling the structure by circulating a cooling fluid through the channels formed by the micro-bubbles or micro-cavities.

44. (currently amended) The method as claimed in claim [[40]] 41, which further comprises introducing a solution of acid into the channels to ~~comically~~ chemically attack the intermediate layer.

45. (previously presented) The method as claimed in claim 34, which further comprises reducing the thickness of the superstrate or substrate.

46. (previously presented) The method as claimed in claim 34, wherein the substrate and the superstrate are formed from monocrystalline silicon.

47. (currently amended) The method as claimed in claim [[46]] 34, wherein the base material ~~is formed from~~ comprises silica and the extrinsic atoms [[are]] comprise atoms of phosphorus ~~or boron~~, thus forming an intermediate layer of phospho-silicate glass ~~or boro-phospho-silicate glass~~.

48. (currently amended) The method as claimed in claim [[47]] 54, wherein the concentration of phosphorus is in the range from 6% to 14% or the concentration of boron is ~~up to~~ in the range from 0% to 4%.

49. (previously presented) The method as claimed in claim 34, wherein the heat treatment is carried out at a temperature in the range from 900 °C to 1200 °C.

50. (currently amended) The method as claimed in claim 34, ~~which further comprises, prior to conducting the heat treatment, carrying out an operation for depositing the intermediate layer on either of the substrate or the superstrate, and~~ wherein the step of assembling further comprises attaching the superstrate or substrate to the intermediate layer by molecular wafer bonding.

51. (currently amended) The method as claimed in claim 50, which further comprises, prior to ~~bonding~~ the step of assembling, providing a thermal silicon oxide on either of the substrate or superstrate that does not include the intermediate layer .

52. (currently amended) The method as claimed in claim [[34]] 50, which further comprises, prior to ~~bonding~~ the step of depositing, providing a thermal silicon oxide on each of the substrate and superstrate, ~~depositing~~ so that the intermediate layer is deposited on the thermal silicon oxide on either of the substrate or the superstrate~~, and attaching the superstrate or substrate to the intermediate layer by molecular wafer bonding~~.

53. (previously presented) The method as claimed in claim 34, which further comprises fabricating the plate as a silicon on insulator plate for the further fabrication of integrated electronic circuits or integrated opto-electronic circuits thereon.

54. (new) The method as claimed in claim 47 wherein extrinsic atoms further comprise atoms of boron, thus forming an intermediate layer of boro-phospho-silicate glass

REMARKS

Claims 34-36 and 38-54 are pending. Claims 1-33 and 37 are canceled.

Claim 34 has been amended largely by combination with a portion of claim 50. Further support for this amendment can also be found in the specification at, e.g., ¶¶ 46, 51 and 58.

Claims 47 and 48 have been amended and claim 54 has been added to make clear that the intermediately layers of this invention must include P but may or may not include B. Support for these amendments can be found in the specification at, e.g., ¶¶ 31-33.

It is submitted that these amended and new claims introduce no new matter.

THE INVENTION

The present invention is directed to fabricating and using multilayer substrates which include at least one insulating intermediate layer that is weakened by a suitable heat so that the substrates become releasable.

The characteristics of the intermediate layer are key to the invention, and one particularly key characteristic of the intermediate layer is that, upon suitable heat treatment, it becomes filled with numerous "microbubbles or microcavities" (referred to herein as a "spongy-transformation") and is, therefore, weakened. But even more key is that such a spongy-transformation is a built-in property of the intermediate layer that is present in the as-deposited intermediate layer. An intermediate layer can, immediately after deposition and without any further processing, undergo a spongy transformation; absolutely no modification of the as-deposited intermediate layer (other than by a suitable heat treatment) is contemplated or claimed by this invention. Specifically, no implantation of gaseous species is needed, no application of stresses, no treatment with various chemicals, in fact, no post-depositional processing of any sort.

Independent claim 34 recites that this spongy transformation is a built-property of the intermediate layer, present immediately in the as-deposited layer, in the following manner:

> 34. (currently amended) A method for fabricating a structure in the form of a plate which method comprises:
>
> depositing at least one intermediate layer on either of a substrate and/or a superstrate wherein the intermediate layer comprises at least one base material having distributed therein extrinsic atoms or molecules which differ from those of the base material;

> assembling the substrate and the superstrate so that the intermediate layer is interposed between the substrate and the superstrate to form a structure; and
>
> applying a heat treatment to the structure in a temperature range that causes the intermediate layer to become plastically deformable with the as-deposited extrinsic atoms or molecules in the base material causing an irreversible formation of microbubbles or microcavities in the intermediate layer in a configuration and amount sufficient to weaken the intermediate layer.

In a first step, the intermediate layer is deposited, and, as-deposited, it comprises compounds, mixtures or associations (or the like) of at least two constituents, a "base material" and "extrinsic atoms or molecules." Importantly, claim 34 requires that these two constituents be present in the as-deposited layer. No post-depositional processing is needed to, e.g., introduce the "extrinsic atoms or molecules" into the "base material" from outside (such as might occur during a subsequent step of implantation of atomic species, or during a subsequent second step of deposition, or the like), or to, e.g., actualize, or cause the formation of, "extrinsic atoms or molecules" within the base material (such as might occur consequent to the application of stresses or the like).

Then, in a subsequent step, a suitable heat treatment is applied in order to cause the "base material" and the "extrinsic atoms or molecules" to interact so that the intermediate layer undergoes the recited irreversible, spongy-transformation characterized by the formation of "microbubbles or microcavities." The "as-deposited extrinsic atoms or molecules" are key to this transformation. Claim 34 specifically requires that it is the "as-deposited extrinsic atoms or molecules" that actually cause the spongy transformation. Stated differently, even if a heat treatment created "microbubbles or microcavities" in some hypothetical intermediate layer, if these "microbubbles or microcavities" were not caused by the "as-deposited extrinsic atoms or molecules" then this situation is not within claim 34. For example, if they were caused by implantation of gaseous ions or atoms, then these "microbubbles or microcavities" are not within claim 34.

CLAIM REJECTIONS UNDER 35 U.S.C. § 102

Claims 34-36, 41, 46, 50 and 53 are rejected under 35 U.S.C. § 102(b) as being anticipated by International patent publication WO 99/35674 to Moriceau et al. WO 99/35674 corresponds to US patent no. 6,756,286 (Moriceau) which will be referred to herein.

These rejections are traversed at least because Moriceau does not disclose an intermediate layer which, as-deposited, possesses the above-described key characteristics, that is comprises "extrinsic atoms or molecules" that cause a spongy transformations in response to heat treatment. Instead, in order to form "micro-cavities" and to become weakened in response to heat treatment, Moriceau's deposited materials require additional post-depositional processing, that is, they require post-depositional "implantation of the said gaseous compounds." Specifically, Moriceau's process proceeds as follows:

> Therefore, the purpose of the invention is a process for the transfer of at least one thin film of solid material delimited in an initial substrate, characterized in that it comprises the following steps:
>
> a step in which a layer of inclusions is formed in the initial substrate at a depth corresponding to the required thickness of the thin film, these inclusions being designed to form traps for gaseous compounds which will subsequently be implanted;
>
> a subsequent step for implantation of the said gaseous compounds, in a manner to convey the gaseous compounds into the layer of inclusions, the dose of implanted gaseous compounds being sufficient to cause the formation of micro-cavities likely to form a fracture plane along which the thin film can be separated from the remainder of the substrate.

Moriceau at col. 3, ll. 1-16. The first step of this process forms inclusions the sole pertinent property of which is that they form traps for "gaseous compounds which will subsequently be implanted." Then, the second step implants the "gaseous compounds" into the layer of inclusions, and it is these implanted "gaseous compounds" that causes "the formation of micro-cavities."

In other words, Moriceau does not deposit any layer that, by itself, and in its as-deposited form," is capable of irreversibly forming "microbubbles or microcavities" during a subsequent heat treatment. Moriceau can form "micro-cavities" only after implantation of gaseous compounds. However, in the present invention, it is "the as-deposited extrinsic atoms or molecules" that form the recited "microbubbles or microcavities," and these "extrinsic atoms or molecules" are not implanted after deposition, but are deposited along with the rest of the intermediate layer.

However, the current Office action (the Action) contends to the contrary, and, in connection with the rejection of claim 34, points to Moriceau at col. 3, ll. 52-65; col. 4, ll. 10-13; col. 4, ll. 26-29; col. 8, ll. 60-67; col. 9, ll. 30-46; col. 10, ll. 13-21; col. 12, ll. 58-64 as

supporting its rejection. But, after careful review of each of these sections, Applicant respectfully submits that disclosure of the claimed intermediate layer cannot be found.

CLAIMS 41 AND 50

It is submitted that claims 41 and 50 are patentable for the following additional reasons.

Claim 41 recites in relevant part that "at least some the microbubbles or microcavities have a volume such that they are open on both the substrate and superstrate side or furthermore are mutually open to constitute channels which are open to the side ends of the intermediate layer." The Action rejects this claim, first, by contending that such "microbubbles or microcavities" are "implicit." But it is submitted that it cannot be inherent that inclusions, which can be as small as "a few tens of nanometers," can span a layer up to several micrometers thick, or that nanometer inclusions can overlap sufficiently to form channels which extend across an entire several inch substrate. Moriceau at col. 2, ll. 31-33. Only certain "microbubbles or microcavities" have such characteristics.

Next, because the substance of previously pending claim 50 now appears in claims 34 and 50 taken together, for simplicity, Applicant considers claim 50 as it was prior to the current amendment when it recited:

> 50. The method as claimed in claim 34, which further comprises, prior to conducting the heat treatment, carrying out an operation for depositing the intermediate layer on either of the substrate or the superstrate, and attaching the superstrate or substrate to the intermediate layer by molecular wafer bonding.

It is submitted that the Actions purported rejections of this claim are based on a misunderstanding or mischaracterization of Moriceau in view of the claimed substrate structure. Very briefly, claim 50 recites a method during which a superstrate and a substrate, one of which carries an intermediate layer on its surface, are assembled together to form a superstrate-intermediate-layer-substrate structure; and then the intermediate layer in this structure is made to undergo a spongy transformation so as to weaken the superstrate-intermediate-layer-substrate structure.

However, all the portions of Moriceau pointed to by the Action, in fact, describe thin film layer transfer and bonding to a support substrate, where the bonding is aided by a bonding layer. The Action contends that such a bonding layer is an intermediate layer. But

this cannot be the case because a bonding layer is for bonding, not weakening, a structure while the intermediate layer of this invention is for weakening, not bonding, a structure.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103

Claims 39, 40, 42 and 47-49 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Moriceau. These rejections are traversed at least because all of these claims depend from claim 34 and Moriceau does not make obvious claim 34.

It is submitted that claims 47, 48 and 54 are patentable for the additional reason that they all require the presence of phosphorous in the intermediate layer, and Moriceau never once mentions phosphorous.

CONCLUSION

Discussion of these proposed claims and brief remarks will be helpful to the applicant.

Respectfully submitted,

Date: _____

_____

Allan A. Fanucci (Reg. No. 30,256)

WINSTON & STRAWN LLP
Customer No. 28765
202-282-5867